

WHAT IS CLAIMED IS:

- 1 1. A method for handling write errors in a non-redundant disk array
2 storage system, comprising:
3 issuing a command to write and verify data transfer when requested to write
4 data to a specified location address that is stored in an error table; and
5 reassigning the data to a new location address when the command to write
6 and verify the data transfer is unsuccessful.
- 1 2. The method of claim 1 wherein the error table records error locations
2 on a disk drive.
- 1 3. The method of claim 1 further comprising transferring the data to the
2 specified location address when a good status is returned in response to the
3 command to write and verify the data transfer.
- 1 4. The method of claim 1 wherein the error table comprises a write
2 recovery table.
- 1 5. The method of claim 1 wherein the error table comprises a combined
2 write recovery table and bad data table.
- 1 6. The method of claim 1 wherein the command to write and verify the
2 data transfer comprises a write/verify command.

1 7. The method of claim 1 wherein the command to write and verify the
2 data transfer comprises a write command followed by a read command with the
3 force unit access bit being set to 1 to force the data to be read from the disk drive
4 rather than from disk drive cache.

1 8. The method of claim 1 wherein the command to write and verify the
2 data transfer is unsuccessful only when a predetermined number of write and verify
3 retries is exhausted.

1 9. The method of claim 1 further comprising:
2 verifying the reassigning of data to a new location address;
3 detecting an error for the reassigning;
4 retrying the reassigning for a predetermined number of times; and
5 returning a fatal error status and marking the disk offline when the
6 predetermined number of times is exhausted.

1 10. The method of claim 1 further comprising deleting the specified
2 location address that is stored in the error table when the reassign of data is
3 successful.

1 11. The method of claim 1 further comprising deleting the specified
2 location address that is stored in the error table when the command to write and
3 verify the data transfer is successful.

1 12. A storage system, comprising:
2 an array of storage devices; and
3 a storage controller, coupled to the array of storage devices, the storage
4 controller including a memory for maintaining an error table, the storage controller
5 further being configured to issue a command to write and verify data transfer when
6 requested to write data to a specified location address that is stored in an error table
7 and reassign the data to a new location address when the command to write and
8 verify the data transfer is unsuccessful.

1 13. The storage system of claim 12 wherein the error table records data
2 error locations on a disk drive.

1 14. The storage system of claim 12 wherein the controller transfers the
2 data to the specified location address when a good status is returned in response to
3 the command to write and verify the data transfer.

1 15. The storage system of claim 12 wherein the error table comprises a
2 write recovery table.

1 16. The storage system of claim 12 wherein the error table comprises a
2 combined write recovery table and bad data table.

1 17. The storage system of claim 12 wherein the command to write and
2 verify the data transfer comprises a write/verify command.

1 18. The storage system of claim 12 wherein the command to write and
2 verify the data transfer comprises a write command followed by a read command
3 with the force unit access bit being set to 1 to force the data to be read from the
4 storage device rather than from cache of the storage controller.

1 19. The storage system of claim 12 wherein the command to write and
2 verify the data transfer is unsuccessful only when a predetermined number of write
3 and verify retries is exhausted.

1 20. The storage system of claim 12 wherein the storage controller further
2 verifies the reassigning of data to a new location address, detects an error for the
3 reassigning, retries the reassigning for a predetermined number of times, returns a
4 fatal error status and marks the storage device offline when the predetermined
5 number of times is exhausted.

1 21. The storage system of claim 12 wherein the storage controller deletes
2 the specified location address that is stored in the error table when the reassign of
3 data is successful.

1 22. The storage system of claim 12 wherein the storage controller deletes
2 the specified location address that is stored in the error table when the command to
3 write and verify the data transfer is successful.

1 23. A error table disposed in a storage controller, the error table
2 configured with addresses for data error locations on a storage device so that for a
3 write request, the storage controller knows to perform a write and verify command to
4 transfer the data to the storage device and to verify the successful transfer of the
5 data to the storage device.

1 24. The error table of claim 23 further comprising a write recovery bit to
2 indicate when an address associate therewith requires a write recovery during a
3 write.

1 25. The error table of claim 24 wherein the write recovery bit allows a bad
2 data table to be combined with the write recovery table.

1 26. The error table of claim 25 wherein on a read the error table is
2 searched only for an address specified in a read request together with an associated
3 write recovery bit being set to 0.

1 27. A memory configured for storing an error table and data fields, the
2 error table comprising a non-volatile array configuration information storage area.

1 28. An article of manufacture comprising a program storage medium
2 readable by a computer, the medium tangibly embodying one or more programs of
3 instructions executable by the computer to perform a method for handling write
4 errors in a non-redundant disk array storage system, the method comprising:
5 issuing a command to write and verify data transfer when requested to write
6 data to a specified location address that is stored in an error table; and
7 reassigning the data to a new location address when the command to write
8 and verify the data transfer is unsuccessful.

1 29. A method for handling write errors in a non-redundant disk array
2 storage system, comprising:
3 recording read error locations in an error table;
4 issuing a command to write and verify data transfer when requested to write
5 data to a specified location address that is stored in the error table; and
6 reassigning the data to a new location address when the command to write
7 and verify the data transfer is unsuccessful.